

REMARKS

The Examiner has indicated that Claims 2-8, 10-14, and 16 are allowed.

New Claim 18 is original Claim 1 amended to specify that, for purposes of Claim 1 and claims dependent thereon, the quench box has only two manways. One feature of the quench box design of the invention is that it only requires two manways, one on the collection tray and one on the final distribution tray. Claim 1 had previously been amended by the Amendment dated April 4, 2005 to indicate that only two manways were present, but the previously amended Claim 1 was again rejected by the Examiner in his final rejection of April 29, 2005. During a telephone interview with Examiner Johnson on July 28, 2005, the Examiner explained his position that he did not believe the language previously added to Claim 1, i.e., "wherein the quench box has only . . . two manways" adequately limited the number of manways in the quench box to two in view of the "comprising" language in the claim, particularly where other alternative language, such as "wherein the quench box 'consists' of only . . . two manways" would more clearly limit the claim. The Examiner seemed to agree that limiting Claim 1 to only two manways would make the claim allowable, but, as indicated he did not like the language used. Further, since the Action outstanding at the time of the telephone interview was a Final Rejection, the Examiner indicated that at that time he would not enter a further amendment to Claim 1. Therefore, Applicant cancelled Claim 1 in response to the Final Rejection. Since the currently outstanding rejection is not a final rejection, applicant reintroduces prior Claim 1 amended using the "consisting of" language suggested by the Examiner. However, it is not the quench box that consists only of the two manways, but the manways in the quench box that "consist" of only two manways. Thus, prior Claim 1 has now been changed by the addition of the last clause "wherein the manways in the quench box consist of only the manway of the collection tray and the manway of the distributor tray for a total of only two manways." Claim 1, and Claims 19 and 10 dependent thereon, should now be allowable. The use of the "consisting of" language to limit the number of manways in the quench

box should clearly limit the invention as claimed in Claims 1, 19, and 10 to two manways. It should be noted that this limitation applies only to Claims 1, 19, and 10.

Although the Examiner had indicated that Claim 10 was allowed, applicant has noticed that Claim 10 depended from cancelled Claim 9, which had depended from cancelled Claim 1. With the rewriting of Claims 1 and 9 as Claims 18 and 19, Claim 10 has been amended to depend from Claim 19.

The Examiner has rejected Claims 15 and 17 under 35 USC 102 as anticipated by Grott. Applicant's Claim 15 recites "a quench pipe manifold and nozzle assembly having an open center portion". The Examiner states that "Grott teaches a quench box manifold and nozzle assembly having an open center portion (figure 1, item 1)". Grott describes the quench gas as passing through a "conduit or header 5 which is attached to the quench distributor 6." (see figure 1). "The distributor has openings not shown which discharge the entering fluid stream [quench fluid] in different directions to promote its admixture into the gas and liquid which emerged from the catalyst bed." However, as indicated in Figure 1 of Grott, the quench distributor 6 cannot be circular with a center opening due to the presence of truss beams 3 for the liquid collection tray 16. Figure 1 shows that the quench distributor 6 goes through the centerline of the reactor. Grott does not show or suggest "a quench pipe manifold and nozzle assembly having an open center portion" so cannot anticipate applicant's invention of Claim 15.

Claim 15 also requires "a mixing chamber having an open central portion . . . large enough for a person to pass therethrough". The Examiner states that Grott teaches a "mixing chamber having an open central portion . . . large enough for a person to pass there through (figure 1, item 20)". As indicated in figures 1 and 2 of Grott, the movement of the liquid in the mixing chamber 20 tends to increase admixture of the liquid and again promotes mass and heat transfer between the vapor and liquid phases leading to closer attainment of equilibrium. The formation of the mixing chamber based on the walls 7 and 8 and plate 25 forces the liquid and vapor to exit the mixing chamber via the

cylindrical opening provided by the encircling wall 8. Grott does not specify the diameter of the opening for the encircling wall 8. However, it is Grott's intention to maximize the vapor and liquid mixing in the mixing chamber as the liquid and vapor exit the mixing chamber via the cylindrical opening provided by the encircling wall 8. It is highly **unlikely** that the encircling wall 8 is designed at greater than twenty four inches so that a person can pass through to avoid the need for a manway.

While Grott does not specify the diameter of the opening formed by the wall 8, guidance in determining the diameter can be obtained from other prior art. For example, Nelson et al. (US 5,989,502) used the word "orifice" for describing an encircling wall corresponding to wall 8 in Grott. The purpose of the "orifice" sizing of the encircling wall is to promote the intimate mixing for the fluid. Therefore, prior art quench box designs, including that of Grott, need an additional manway on the plate 25 to accommodate the needs during reactor catalyst changeout. The inventors study of the Grott and other prior art patents indicate that the diameter of the opening formed by wall 18 in Grott, and similar openings in other prior art would be less than about nineteen inches. An opening of at least about twenty four inches is necessary for a manway. Grott does not show or suggest "a mixing chamber having an open central portion . . . large enough for a person to pass therethrough" so cannot anticipate applicant's invention of Claim 15.

Claim 17 requires "a final distributor tray for distributing fluid to a catalyst bed below the distributor tray, said distributor tray having a manway and downcomer pipes having top slots and side orifices to accommodate flow of the two-phase fluid stream to the catalyst bed below." The Examiner states that Grott teaches "a final distributor tray having a manway and downcomer pipes having top slots and side orifices to accommodate flow of the two phase fluid stream (figure 1, item 21)". However, as indicated in Figure 1 of Grott, Grott uses the conventional bubble-cap distributor for the distributor tray 22. Caps 13 are required due to the use of a perforated tray with sixteen mm holes for the rough liquid distributor 21. The perforated rough liquid distributor creates a shower of liquid onto

to final liquid distributor 22. The conventional downcomer pipes having top slots and side orifices cannot be applied to the Grott design due to the use of perforated rough liquid distributor 21. Grott does not show or suggest "a final distributor tray for distributing fluid to a catalyst bed below the distributor tray, said distributor tray having a manway and downcomer pipes having top slots and side orifices to accommodate flow of the two-phase fluid stream to the catalyst bed below" so cannot anticipate applicant's invention of Claim 17. Applicant's downcomer pipes having top slots and side orifices would not work satisfactorily in Grott.

The application now has four independent claims. However, the application had four independent claims prior to the cancellation of Claim 1 in the Amendment After Final dated July 29, 2005. Four independent claims have previously been paid for. Please charge any fees due or credit any overpayments to deposit account no. 20-0100 of the undersigned.

Dated this 15th day of November, 2004.

Respectfully submitted,



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